

WHAT IS CLAIMED IS:

1. A method comprising the steps of:
receiving a graphics function call from a driver;
5 converting the graphics function call to a native command set for execution on a
native system; and
capturing the native command set in a in a database.
2. The method as in Claim 1, wherein the database includes a single file.
- 10 3. The method as in Claim 1, wherein the driver includes a queue server, wherein the
queue server is capable of receiving multiple commands of the native command set
and outputting the commands.
- 15 4. The method as in Claim 1, wherein the graphics function call is a draw command.
5. The method as in Claim 4, wherein when the draw command is an indexed draw
command, capturing the native command set includes storing the indexed draw
command and storing a direct draw command associated with the indexed draw
20 command.
6. The method as in Claim 5, wherein, for each captured indexed draw command, a first
mode of operation executes a direct draw command related to the indexed draw
command directly and a second mode of operation stores data associated with the
25 direct draw command in buffer locations and then executes the indexed draw
command.
7. The method as in Claim 5, wherein stored indexed draw commands are made
inoperative using a no-op command.
- 30 8. The method as in Claim 7, wherein the no-op command is a type-3 no-op command.

9. The method as in Claim 7, wherein, for each captured indexed draw command, a first mode of operation executes a direct draw command related to the indexed draw command directly and a second mode of operation stores data associated with the direct draw command in buffer locations and then executes the indexed draw command.
10. The method as in Claim 5, wherein storing indexed draw commands includes storing vertex data associated with the indexed draw command.
11. The method as in Claim 10, further including the step of:
configuring the driver to provide a virtual address indicating a location of the vertices of the indexed draw command when the indexed draw command uses a physical location of the vertices.
12. The method as in Claim 1, further including the step of:
issuing the native command set to a first system, capable of executing the native command set, simultaneous with the step of capturing the native command set.
13. The method as in Claim 12, further including the step of:
providing commands in the database to a second system for execution subsequent to the step of capturing the native command set.
14. The method as in Claim 13, wherein the first system and the second system are the same system.
15. The method as in Claim 14, wherein the first system and the second system are one of the following: a graphics chip; a hardware emulator; a software simulator; or an architectural description analyzer.
16. The method as in Claim 13, wherein the first system and the second system are different systems.

17. The method as in Claim 1, further including the step of:
re-mapping a system to match indexed physical values, wherein the system is used for
simulating a native system related to the native command set.
- 5
18. The method as in Claim 17, further including the step of:
simulating the native system by executing commands.
19. The method as in Claim 18, further including the step of:
10 tracking the number of clock cycles in executing the commands.
20. The method as in Claim 18, further including the step of:
un-mapping the system when the simulation is complete.
- 15 21. The method as in Claim 1, further including the steps of:
receiving architectural description; and
determining an estimated performance, based on the architectural description and
workload characteristics of the native command set.
- 20 22. The method as in Claim 21, wherein the workload characteristics relate to 3D graphics
performance, as defined with the native command set.
23. The method as in Claim 21, wherein the workload characteristics relate to 2D graphics
performance, as defined with the native command set.
- 25
24. The method as in Claim 21, wherein the workload characteristics relate to memory
usage, as defined with the native command set.

25. A system comprising:
a data processor having an I/O buffer; and
a memory having an I/O buffer coupled to the I/O buffer of the data processor; the
memory capable of storing code for:
5 an application capable of generating graphics function calls;
a driver capable of capturing the graphics function calls and converting the
graphics function calls to a native command set; and
a routine capable of capturing the native command set to a database.
- 10 26. The system as in Claim 25, wherein the database includes a single file for collecting
the native command set.
27. The system as in Claim 25, wherein the driver includes a queue server, wherein a
queue server is capable of receiving multiple commands of the native command set
15 and outputting the commands.
28. The system as in Claim 25, wherein the graphics function call is a draw command.
29. The system as in Claim 28, wherein, for each indexed draw command, the routine is
20 further capable of storing the indexed draw command and storing a direct draw
command associated with the indexed draw command.
30. The system as in Claim 29, wherein, for each stored indexed draw command, a first
mode of operation executes the direct draw command associated with the indexed
25 draw command directly and a second mode of operation stores data associated with
direct draw command in buffer locations and then executes the indexed draw
command.
31. The system as in Claim 29, wherein stored indexed draw commands are made
30 inoperative using a no-op command.

32. The system as in Claim 31, wherein the no-op command is a type-3 no-op command.
33. The system as in Claim 31, wherein, for each stored indexed draw command, a first mode of operation executes the direct draw command associated with the indexed draw command directly and a second mode of operation stores data associated with direct draw command in buffer locations and then executes the indexed draw command.
34. The system as in Claim 29, wherein storing indexed draw commands includes storing vertex data associated with the indexed draw commands.
35. The system as in Claim 34, wherein the driver is configured to provide a virtual address indicating a location of the vertices of the indexed draw command when the indexed draw command uses a physical location of the vertices.
36. The system as in Claim 25, further including:
a first system capable of executing the native command set simultaneous with the database capturing the native command set.
37. The system as in Claim 36, further including:
a second system capable of executing the command set captured in the database.
38. The system as in Claim 37, wherein the first system and the second system are the same system.
39. The system as in Claim 38, wherein the first system and the second system are one of the following: a graphics chip; a hardware emulator; a software simulator; or an architectural description analyzer.
40. The system as in Claim 37, wherein the first system and the second system are different systems.

41. The system as in Claim 37, wherein the second system is re-mapped to match indexed physical values, and wherein the second system is used for simulating a native system related to the native command set.
- 5 42. The system as in Claim 41, wherein the second system is further capable of simulating the native system by executing commands.
43. The system as in Claim 42, wherein the second system includes counters capable of tracking the number of clock cycles used in executing the commands.
- 10 44. The system as in Claim 42, wherein the second system is un-mapped when the simulation is complete.
45. The system as in Claim 25, further including:
15 an architectural description; and
a performance analyzer capable of determining an estimated performance, based on the architectural description and workload characteristics.
46. The system as in Claim 45, wherein the workload characteristics relate to 3D graphics
20 performance, as defined with the native command set.
47. The system as in Claim 45, wherein the workload characteristics relate to 2D graphics performance, as defined with the native command set.
- 25 48. The system as in Claim 45, wherein the workload characteristics relate to memory usage, as defined with the native command set.

49. A method of determining graphics processing performance, the method comprising:
receiving a graphics function call from a driver;
converting the graphics function call to a native command set for execution on a
native system;
5 capturing the native command set in a database; and
executing the command set to determine graphics processing performance.
50. The method as in Claim 49, wherein the database includes a single file.
- 10 51. The method as in Claim 49, wherein executing includes hardware emulation.
52. The method as in Claim 49, wherein executing includes software simulation.
53. The method as in Claim 49, wherein the driver includes a queue server, wherein the
15 queue server is capable of receiving multiple commands of the native command set
and outputting the commands.
54. The method as in Claim 49, wherein the graphics function call is a draw command.
- 20 55. The method as in Claim 54, wherein, for each indexed draw command, capturing the
native command set includes storing the indexed draw command and storing a direct
draw command associated with the indexed draw command.
56. The method as in Claim 55, wherein, for each stored indexed draw command, a first
25 mode of operation executes the direct draw command associated with the indexed
draw command directly and a second mode of operation stores data associated with
direct draw command in buffer locations and then executes the indexed draw
command.
- 30 57. The method as in Claim 55, wherein stored indexed draw commands are made
inoperative using a no-op command.

58. The method as in Claim 57, wherein the no-op command is a type-3 no-op command.
59. The method as in Claim 57, wherein, for each stored indexed draw command, a first mode of operation executes the direct draw command associated with the indexed draw command directly and a second mode of operation stores data associated with direct draw command in buffer locations and then executes the indexed draw command.
60. The method as in Claim 55, wherein storing indexed draw commands includes storing vertex data associated with the indexed draw commands.
61. The method as in Claim 60, further including the step of:
configuring the driver to provide a virtual address and to request a physical address indicating a location of the vertices of the indexed draw command when the indexed draw command uses a physical location of the vertices.
62. The method as in Claim 49, further including the step of:
issuing the native command set to a first system, capable of executing the native command set, simultaneous with the step of capturing the native command set.
63. The method as in Claim 62, further including the step of:
providing commands in the single file to a second system for execution subsequent to the step of capturing the native command set.
64. The method as in Claim 63, wherein the first system and the second system are the same system.
65. The method as in Claim 64, wherein the first system and the second system are one of the following: a graphics chip; a hardware emulator; a software simulator; or an architectural description analyzer.

66. The method as in Claim 63, wherein the first system and the second system are different systems.
67. The method as in Claim 49, further including the step of:
5 re-mapping a system to match indexed physical values, wherein the system is used for
simulating a native system related to the native command set.
68. The method as in Claim 67, further including the step of:
simulating the native system by executing commands.
69. The method as in Claim 68, further including the step of:
10 tracking the number of clock cycles in executing the commands.
70. The method as in Claim 68, further including the step of:
15 un-mapping the system when the simulation is complete.
71. The method as in Claim 49, further including the steps of:
receiving architectural description; and
determining an estimated performance based on the architectural description and
20 workload characteristics of the native command set.
72. The method as in Claim 71, wherein the workload characteristics relate to 3D graphics performance, as defined with the native command set.
73. The method as in Claim 71, wherein the workload characteristics relate to 2D graphics
25 performance, as defined with the native command set.
74. The method as in Claim 71, wherein the workload characteristics relate to memory usage, as defined with the native command set.